# DIGITRON SEMICONDUCTORS

## S2800 SERIES — SILICON CONTROLLED RECTIFIER

Available Non-RoHS (standard) or RoHS compliant (add PBF suffix).
Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.

### MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| **Peak repetitive forward and reverse blocking voltage**(1) ($T_J$ = 25 to 100°C, gate open)<br>S2800F<br>S2800A<br>S2800B<br>S2800D<br>S2800M<br>S2800N | $V_{RRM}$, $V_{DRM}$ | <br>50<br>100<br>200<br>400<br>600<br>800 | Volts |
| **Peak non-repetitive reverse voltage and non-repetitive off-state voltage**(1) ($T_J$ = 25 to 100°C, gate open)<br>S2800F<br>S2800A<br>S2800B<br>S2800D<br>S2800M<br>S2800N | $V_{RSM}$, $V_{DSM}$ | <br>75<br>125<br>250<br>500<br>700<br>900 | Volts |
| **Forward on-state current RMS** (all conduction angles), $T_C$ = 75°C | $I_{T(RMS)}$ | 10 | Amps |
| **Peak forward surge current** (one cycle, sine wave, 60Hz, $T_C$ = 80°C) | $I_{TSM}$ | 100 | Amps |
| **Circuit fusing considerations** (t = 8.3ms) | $I^2t$ | 40 | $A^2s$ |
| **Forward peak gate power** (t ≤ 10μs) | $P_{GM}$ | 16 | Watts |
| **Forward average gate power** | $P_{G(AV)}$ | 0.5 | Watts |
| **Operating junction temperature range** | $T_J$ | -40 to +100 | °C |
| **Storage temperature range** | $T_{stg}$ | -40 to +150 | °C |

Note 1: $V_{DRM}$ for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; however, positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

### THERMAL CHARACTERISTICS

| Characteristic | Symbol | Maximum | Unit |
|---|---|---|---|
| **Thermal resistance, junction to case** | $R_{\Theta JC}$ | 2 | °C/W |

### ELECTRICAL CHARACTERISTICS ($T_C$ = 25°C unless otherwise noted)

| Characteristic | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| **Peak forward or reverse blocking current** ($V_{AK}$ = $V_{DRM}$ or $V_{RRM}$, gate open)<br>$T_C$ = 25°C<br>$T_C$ = 100°C | $I_{DRM}$ | <br>-<br>- | <br>-<br>- | <br>10<br>2 | <br>μA<br>mA |
| **Instantaneous on-state voltage** ($I_{TM}$ = 30A peak, pulse width ≤ 1ms, duty cycle ≤ 2%) | $V_T$ | - | 1.7 | 2 | Volts |
| **Gate trigger current (continuous dc)** ($V_D$ = 12V, $R_L$ = 30Ω) | $I_{GT}$ | - | 8 | 15 | mA |
| **Gate trigger voltage (continuous dc)** ($V_D$ = 12V, $R_L$ = 30Ω) | $V_{GT}$ | - | 0.9 | 1.5 | Volts |
| **Holding current** ($V_D$ = 12V, gate open, $I_T$ = 150mA) | $I_H$ | - | 10 | 20 | mA |
| **Gate controlled turn-on time** ($V_D$ = rated $V_{DRM}$, $I_{TM}$ = 2A, $I_{GR}$ = 80mA) | $t_{gt}$ | - | 1.6 | - | μs |

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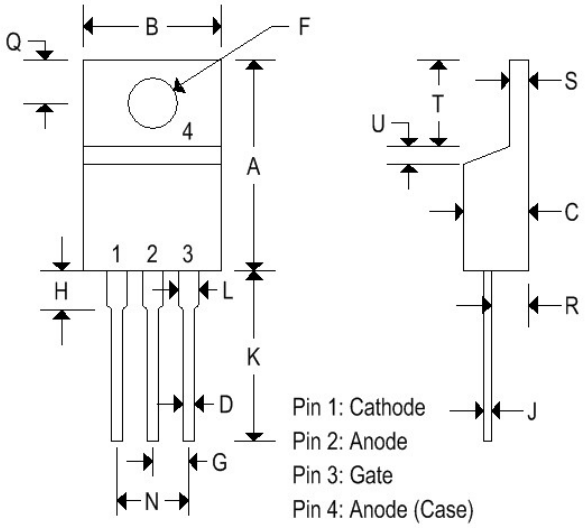
| Characteristic | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| **Circuit commutated turn-off time** ($V_D = V_{DRM}$, $I_{TM}$ = 2A, pulse width ≤ 50µs, dv/dt = 200V/µs, di/dt = 10A/µs, $T_C$ = 75°C ) | $t_q$ | - | 25 | - | µs |
| **Critical rate of rise of off-state voltage** ($V_D$ = Rated $V_{DRM}$, exponential rise, $T_C$ = 100°C) | dv/dt | - | 100 | - | V/µs |

### MECHANICAL CHARACTERISTICS

| | |
|---|---|
| **Case** | TO-220AB |
| **Marking** | Body painted, alpha-numeric |
| **Pin out** | See below |




| | TO-220AB | | | |
|---|---|---|---|---|
| | Inches | | Millimeters | |
| | Min | Max | Min | Max |
| A | 0.575 | 0.620 | 14.600 | 15.750 |
| B | 0.380 | 0.405 | 9.650 | 10.290 |
| C | 0.160 | 0.190 | 4.060 | 4.820 |
| D | 0.025 | 0.035 | 0.640 | 0.890 |
| F | 0.142 | 0.147 | 3.610 | 3.730 |
| G | 0.095 | 0.105 | 2.410 | 2.670 |
| H | 0.110 | 0.155 | 2.790 | 3.930 |
| J | 0.014 | 0.022 | 0.360 | 0.560 |
| K | 0.500 | 0.562 | 12.700 | 14.270 |
| L | 0.045 | 0.055 | 1.140 | 1.390 |
| N | 0.190 | 0.210 | 4.830 | 5.330 |
| Q | 0.100 | 0.120 | 2.540 | 3.040 |
| R | 0.080 | 0.110 | 2.040 | 2.790 |
| S | 0.045 | 0.055 | 1.140 | 1.390 |
| T | 0.235 | 0.255 | 5.970 | 6.480 |
| U | - | 0.050 | - | 1.270 |
| V | 0.045 | - | 1.140 | - |
| Z | - | 0.080 | - | 2.030 |

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**FIGURE 1 – CURRENT DERATING**

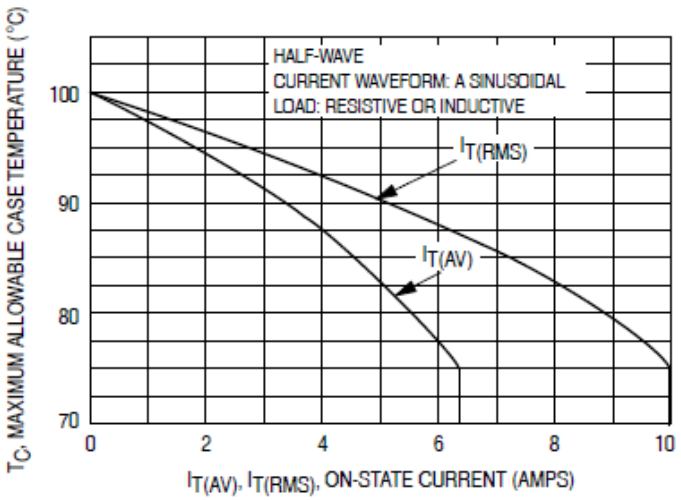
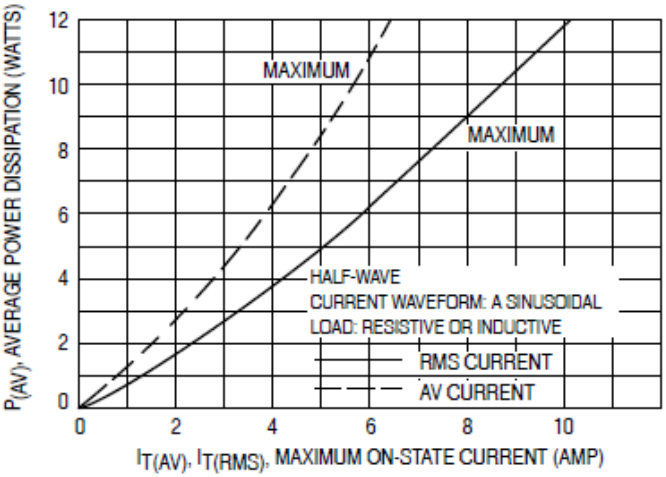



**FIGURE 2 – POWER DISSIPATION**





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